Name:_____

Test Your Skills - 04
Deadline - 3/10

Answer these exercises, in complete mathematical sentences and using mathematical notation properly. You are to work on these individually, without collaboration. You may consult your book and myself, but **not the math lab** or other resources. To earn extra credit, stop into my office hours (or make an appointment) and present your solutions. Partial credit will be given for any earnest attempt.

Exercise 1. *Find the equation of the largest sphere with center* $(6, 7, 10)$ *that is contained in the first octant.*

Exercise 2. *Use vectors to show that the line joining the midpoints of two sides of a triangle is parallel to the third side, and half its length.*

Exercise 3. *Find the angle between a diagonal of a cube and a diagonal of one of its faces.*

Exercise 4. *Under what conditions on* $\vec{u}$*,* $\vec{v}$*, and* $\vec{w}$ *does the following hold?:*

$$(\vec{u} \times \vec{v}) \times \vec{w} = \vec{u} \times (\vec{v} \times \vec{w})$$

Prove your answer.